Instructions: Complete each of the following as practice.

1. Let $L\colon V \to W$ be a linear map. Prove if $U \leq W$, then $L^{-1}U \coloneqq \{v \in V : L(v) \in U\}$ is a subspace of V.
2. Suppose $L\colon V \to W$ is a linear map and B_0 is a basis of $\ker(L)$. Extend B_0 to a basis B of V. Prove $\{L(b) : b \in B \setminus B_0\}$ is a basis of $\operatorname{ran}(L)$.
3. For further exercises, see the following (note: this list may break with future versions of these textbooks).
   (a) Beezer NONE
   (b) Hefferon page 208 (problems 2.21 – 2.47)
   (c) Matthews NONE